

4.0 SUMMARY

The USACE implements a yearly monitoring program at F. E. Walter Reservoir to evaluate potential public health concerns. In general, the monitoring programs emphasize measuring water quality and sediment contamination. Monitoring results are compared to state and federal criteria to evaluate the condition of F. E. Walter Reservoir. The 2001 monitoring program of F. E. Walter Reservoir comprised three major elements:

- monthly water quality monitoring of nutrient and organic contamination, bacteria levels, and physical/chemical conditions at fixed stations from April through October;
- sediment priority pollutant monitoring for semi volatile organic compounds and metals at one fixed station; and
- drinking water monitoring conducted at the water fountain in the operations building.

4.1 WATER QUALITY MONITORING

Water quality monitoring at F. E. Walter Reservoir generally indicated the presence of acceptable conditions during 2001. In general surface and downstream water quality were in compliance with the PADEP water quality standard, a minimum concentration of 5-mg/L. However, dissolved oxygen (DO) in the lower water column of the deeper portions of the reservoir was below standards at two stations in August. Measures of pH were within the water quality standard range from 6 to 9. F. E. Walter Reservoir contained acceptable levels of nutrients during 2001. Ammonia, nitrate + nitrite, TDS, and alkalinity were in compliance with state water quality standards throughout the reservoir watershed.

4.2 MONITORING PROGRAM TRENDS

Trends computed for individual stations using the Mann-Kendall test indicated significant water quality changes at several locations in the F. E. Walter Reservoir drainage. Ammonia was decreasing in the reservoir watershed in both spring and summer seasons. Station WA-1, -2, and -3 all had decreasing trends for total nitrogen. Trends for fecal coliform were increasing during the summer at upstream stations, WA-4 and WA-5, as well as downstream of the reservoir at station WA-1. Trends for total phosphorus, TDS, BOD, and total coliform were not significant.

4.3 TROPHIC STATE CLASSIFICATION

The trophic condition of F.E. Walter Reservoir was characterized as mesotrophic in 2001. The trophic status was defined independently by Carlson's trophic state indices and EPA criteria. Both classifications were based on concentrations of chlorophyll *a* and secchi disk depths.

4.4 COLIFORM BACTERIA MONITORING

Coliform bacteria contamination at F. E. Walter Reservoir was generally acceptable during 2001. However, the geometric means during September monitoring was higher than the PADEP water quality standards of 200 colonies/100-ml. Both regression and Mann-Kendall analyses indicated an increasing trend for fecal coliform downstream of the reservoir during summer. The Mann-Kendall also determined an increasing trend upstream on the Lehigh River (WA-4) for fecal coliform during the summer.

4.5 SEDIMENT PRIORITY POLLUTANT MONITORING

F.E. Walter Reservoir was in compliance with NJDEP soil guidelines in 2001. Concentrations of most metals and semivolatile organic compounds were less than screening guidelines. Only beryllium exceeded the NJDEP soil guidelines.

4.6 DRINKING WATER MONITORING

F. E. Walter Reservoir drinking water was in compliance with PADEP drinking water standards for primary and secondary and bacteria with the exception of pH and manganese. Manganese concentration of 0.053 mg/L exceeded the PADEP drinking water standards by 0.003 mg/L. Measures of pH were less than the standard range of 6.5 to 8.5.